



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/823,427

04/12/2004

Mark W. Kroll

A04P1032

4017

36802

7590

08/17/2006

PACESETTER, INC.  
15900 VALLEY VIEW COURT  
SYLMAR, CA 91392-9221

EXAMINER

HELLER, TAMMIE K

ART UNIT

PAPER NUMBER

3766

DATE MAILED: 08/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/823,427

Applicant(s)

KROLL, MARK W.

Examiner

Tammie Heller

Art Unit

3766

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-7, 9 and 12 is/are allowed.
- 6) ☒ Claim(s) 1-4, 8, 10, 11 and 13-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The amendment filed on June 22, 2006 has been received and considered. By this amendment, claims 1, 15, and 17 have been amended and claims 1-22 are now pending in the application.

### ***Response to Arguments***

2. Applicant's arguments filed June 22, 2006 have been fully considered but they are not persuasive. Applicant argues that Fischell fails to teach combining corresponding ST segments from a plurality of electrograms, each electrogram obtained using a different electrode configuration, to determine an ST segment value for comparison with a standard value to detect and discriminate between ischemia and myocardial infarction. First, Fischell discloses at col. 11, ln. 16-20 multiple electrode configurations that may be employed to provide a plurality of electrograms, each electrogram corresponding to cardiac activity sensed by a different one of the plurality of electrode configurations. Further, with reference to Figure 4, a plurality of electrograms may be recorded via electrodes 14, 17, and 18. Each of these electrograms are passed through the amplifier 36, analog to digital converter 41, and into FIFO buffer 42. Because the electrograms are all recorded concurrently, they enter FIFO buffer 42 at the same time, thus exiting FIFO buffer 42 at the same time. The plurality of electrograms are therefore inherently combined within CPU 44 in order to derive the ST shift. As discussed in the previous Office Action, the ST shift is derived from combining corresponding segments from the plurality of electrograms (see col. 7, ln. 53-60). Therefore, Fischell discloses combining corresponding ST segments from a plurality of

Art Unit: 3766

electrograms, each electrogram obtained using a different electrode configuration, to determine an ST segment value for comparison with a standard value to detect and discriminate between ischemia and myocardial infarction. Furthermore, to respond to Applicant's inquiry about the feature in Fischell that corresponds to Applicant's claimed "standard value", the Examiner points to step 485 in Figure 10 and col. 29, ln. 57-col. 30, ln. 1-15).

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1-3, 8, 10-11, 15-17, and 19-22 are rejected under 35 U.S.C. 102(a) as being anticipated by Fischell et al. (U.S. Patent No. 6,609,023, cited by applicant). Regarding claims 1, 15-17, and 21, Fischell et al. discloses a system for the detection of cardiac events, including a plurality of electrodes which provide a plurality of cardiac activity sensing electrode configurations (see col. 15, ln. 28-32), a sensing circuit that provides a plurality of electrograms (see col. 34, ln. 19-21), each electrogram corresponding to cardiac activity sensed by a different one of the plurality of cardiac activity sensing electrode configurations, and a discriminator 44 that detects and discriminates between ischemia and myocardial infarction in response to ST segments of the electrograms (see Figure 4 and col. 1, ln. 24-27). Furthermore, Fischell discloses

Art Unit: 3766

combining corresponding ST segments from the plurality of electrograms to determine the ST segment value (see col. 7, ln. 53-60).

5. Regarding claims 2 and 22, the discriminator 44 of Fischell et al. is disclosed to be responsive to positive ST segment values with respect to a baseline in order to detect myocardial infarction (see Figure 6 and col. 20, ln. 55-58). Furthermore, Fischell et al. discloses a subroutine for ischemia detection that consists of setting an allowable factor increase or decrease,  $\mu(A)$ , in the ST shift detection and comparing this value to the detected ST shift (see Figure 10, step 485). Therefore, the discriminator of Fischell et al. is responsive to negative ST segment values (an allowable factor decrease) with respect to a baseline to detect ischemia.

6. Regarding claim 3, the device of Fischell et al. is disclosed to include a conductive enclosure which is one of the plurality of electrodes (see col. 3, ln. 64-65).

7. Regarding claim 8, it is disclosed that the device of Fischell et al. discriminates between an ischemic condition, a myocardial infarcted condition, and an equivocal condition of the heart (see Abstract, ln. 23-25).

8. Regarding claims 10-11 and 19-20, Fischell et al. teaches that in response to detection of an equivocal condition, the discriminator provides a secondary analysis wherein the ST segment shifts are correlated with heart rate or R-R interval (see col. 2, ln. 19-21).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fischell et al. in view of Steinhaus et al. (U.S. Patent No. 5,273,049). Fischell et al. discloses the invention essentially as claimed but fails to disclose a summer that provides a sum of the absolute value of the electrograms. Steinhaus et al. discloses a method for detection of cardiac arrhythmias using template matching which includes a normalization step wherein the normalize-electrogram-amplitude block 111 compensates for the variability in physiological signals by computing the sum of the absolute values of the electrogram signal samples (see Figure 5 and col. 14, ln. 7-9). The normalization step of Steinhaus et al. is utilized in order to compensate for the variability that is present in physiological signals and to improve the arrhythmia detection accuracy. Therefore, it would have been obvious to one of ordinary skill in the art to utilize the normalization step of Steinhaus et al. in the ischemia and myocardial infarction detection protocols of Fischell et al. in order to compensate for the variability present in physiological signals, thus improving the arrhythmia detection accuracy.

11. Claims 13-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischell et al. in view of Arzbaecher et al. (U.S. 2003/0023175). Fischell et al.

discloses the invention essentially as claimed but fails to disclose the determination of an ischemia burden responsive to detecting ischemia. Arzbaeher et al. discloses an implantable cardiac arrest monitor system that detects ischemia and characterizes the severity of the risk based on the frequency and duration of the active ischemia, in order to evaluate the amount of damage to the heart tissue that may have been caused by the ischemic episode (see paragraph 44, ln. 12-13). Therefore, it would have been obvious to one of ordinary skill in the art to characterize the severity of the ischemic risk based on the duration of the ischemia, as taught by Arzbaeher et al., in order to evaluate the amount of damage to the heart tissue that may be caused by a given ischemic episode.

***Allowable Subject Matter***

12. Claims 5-7, 9, and 12 are allowed.

***Conclusion***

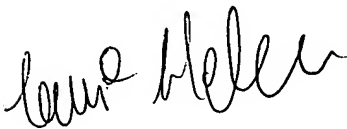
13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

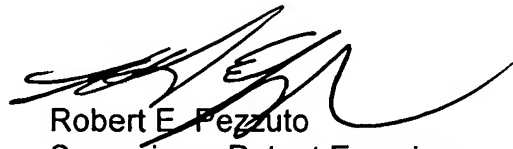
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tammie Heller whose telephone number is 571-272-1986. The examiner can normally be reached on Monday through Friday from 7am until 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert E. Pezzuto can be reached on 571-272-6996. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tammie K. Heller  
Patent Examiner  
Art Unit 3766



Robert E. Pezzuto  
Supervisory Patent Examiner  
Art Unit 3766

TKH